

Tab 1 to Attachment F

Nuclear Power Plant Accident

Given the regulatory considerations associated with planning for response to a nuclear power plant accident, it is essential that NUREG-0654/FEMA-REP-1, Rev. 1, its supplements, and FEMA Guidance Memoranda be used as the primary source documents for addressing the planning needs associated with this hazard. The information in this attachment complements the planning guidance cited above and is intended to help facilitate the identification of the necessary planning considerations that should be addressed if the jurisdiction chooses to include this hazard in its all-hazard EOP.

The Hazard

Nature of the Hazard Radioactive materials are produced in the operation of nuclear reactors. The accidental release of these materials into the atmosphere can harm people and damage the environment.

Risk Area The risk area associated with accidents at a fixed commercial nuclear power reactor is divided into two specific geographic areas called EPZs. EPZs define the areas for which planning is needed to ensure prompt and effective actions are taken to protect the health and safety of the public if an accident occurs. Although in theory an EPZ is a circle centered on the power plant, the size and actual shape of each EPZ will be determined by the characteristics of a particular site (e.g., topography, identifiable landmarks, etc.).

The plume exposure pathway (10-mile EPZ) includes everything within approximately a 10-mile radius of the power plant. Human health and safety risks associated with it include: whole body injury from exposure to gamma radiation; and thyroid, lung, and possibly other organ injury from inhalation of radioactive materials.

The ingestion exposure pathway (50-mile EPZ) includes everything within approximately a 50-mile radius of the power plant. Human health and safety risks associated with it include whole body and thyroid injury from ingestion of radiologically contaminated water and food.

Environmental concerns associated with both EPZs include contamination of:

- People.
- The water supply.
- The crops and feed that people, domesticated animals, and wildlife consume.
- The livestock and milk or milk products that people consume.
- The areas people occupy (i.e. where they work, live, play, etc.).

Nuclear Power Plant Accident Unique Planning Considerations

This section contains a listing of the functional annexes that typically would require the preparation of a hazard-specific appendix for nuclear power plant accidents. It also identifies many of the unique and regulatory planning considerations that should be examined by the planning team and addressed, as appropriate, when preparing nuclear power plant accident hazard-specific appendices.

Direction and Control

For this hazard, four emergency classification levels (ECL) have been established. These ECLs describe the specific emergency actions that must be accomplished by the licensee and off-site emergency response organizations. As the emergency situation escalates from a small on-site problem to an emergency with off-site implications, each of the emergency classification levels provides for a gradual expansion of response actions as the situation warrants. The four levels are: 1) Notification of Unusual Event, 2) Alert, 3) Site Area Emergency, and 4) General Emergency, this last being the most severe.

Jurisdictions located in the 10- and 50-mile EPZs should include in their EOPs the appropriate tasking for response organizations to accomplish the response actions required by each of the emergency classification and action levels. When more than one jurisdiction is located in the same EPZ it is necessary for the jurisdictions to work together to sort out the response tasking each jurisdiction will perform.

The State is responsible for specifying the protective measures for the public and response personnel for both the plume exposure and ingestion pathway EPZs.

Provisions should be made, as appropriate, to address the following planning considerations in one or more appendices to a direction and control annex:

- Describing the specific responsibilities assigned to the jurisdictional response organizations located in both EPZs. Typical tasks include:
 - Preparation of written agreements that specify the concept of operations and specify the response roles of Federal agencies and of State, local, and private sector response organizations located in the EPZ.
 - Provisions for sending a member from the emergency response organization to the licensee's near-site Emergency Operations Facility to serve as a liaison officer, if needed.
 - Requirement to:
 - Identify radiological laboratories that can be used to provide radiological monitoring and analyses services.
 - Identify nuclear and other facilities, organizations, and individuals that can provide resources or skills that can be relied upon to support the response effort.
 - Provide the personnel and equipment to perform off-site radiological monitoring.
 - Inspect, inventory, and operationally check radiological detection equipment and instruments at least once each calendar quarter and after each use.
 - Make rapid assessments of the actual or potential magnitude and locations of radiological hazards caused by a nuclear power plant accident.
 - Quantify the dose rate and the gross radioactivity measurements for the isotopes specified in NUREG-0654/FEMA REP-1, Rev.1, Table 3.

- Make arrangements with State or Federal agencies to locate and track the airborne radioactive plume.
- *Tasking applicable to jurisdictional response organizations located in the plume exposure pathway EPZ Address:*
 - Provisions to accomplish field monitoring.
 - The means that will be used to detect and measure radioiodine concentrations in the air (down to 10^{-7} microcurie per cubic centimeter).
 - Provisions for determining the best protective options and measures (evacuation, sheltering, etc.) for the people in the risk area during emergency conditions.
 - Provisions for traffic management and control of access to the affected area.
 - Post-event actions to be taken by emergency response personnel, as soon as environmental conditions and safety considerations permit. These include:
 - Provisions for relaxing the protective measures that have been implemented.
 - Means to be used for determining the appropriate time to allow evacuees and the general public to leave mass care facilities (if used) and return to their homes.
- *Tasking applicable to the jurisdictional response organizations located in the ingestion pathway EPZ. Normally, the State emergency management organization will be primarily responsible for the response planning required for this EPZ. An appendix to the State or local EOP (as appropriate) must address the provisions that have been made:*
 - To detect contamination.

- For implementing procedures that will protect the public and prevent them from consuming contaminated foodstuffs. Protective actions may include impoundment, decontamination, processing, weathering, and product replacement/substitution.
 - To prepare maps that can be used to record survey and monitoring information applicable to farm crops, livestock, soil samples, dairies, food processing plants, water sheds, water supply intake and treatment plants, and reservoirs. The maps must include all of the activities cited above that are located in the 50-mile EPZ.
- *Requests for Federal assistance.* In order to accurately quantify the potential long term health and environmental consequences of an accident, sophisticated monitoring equipment and scientific analytical techniques are needed. Such equipment and technical expertise usually are not maintained by State and local governments. Accordingly, provisions for requesting Federal agency resources (those available through the FRERP) to meet this need should be included in a tab to the hazard-specific appendix.

Communications

Provisions must be made to ensure the State and local EOCs have a communications link with the nuclear facility and the facility's near-site Emergency Operations Facility, if manned.

Warning

The nuclear facility licensee is responsible for notifying off-site local and State government response organizations in those jurisdictions that may be affected when an emergency occurs.

The following jurisdictional responsibilities for planning should be addressed in one or more appendices to a warning annex:

*Public
Warning*

Warning of the public is a critical function related to this hazard. The public must be given timely instructions with regard to the specific protective actions to be taken. These instructions should describe the area(s) affected and address evacuation, sheltering in place, etc., as appropriate to the situation and time available. Further, the means chosen to accomplish the warning must ensure public health and safety.

*Adjacent
Jurisdictions,
State(s), and
the Federal
Government*

Provisions should be made for notifying and coordinating with every jurisdiction and level of government located within the 10- and 50-mile EPZs. Also, local jurisdictions should contact their State EOC to confirm that they have been notified by the licensee. The State EOC should alert the FEMA Regional Office.

**Emergency
Public
Information**

This section deals with the provisions made to prepare and disseminate notifications, updates, and instructional messages to follow up on the initial warning information passed to the public located within the plume exposure pathway.

The following planning considerations should be examined and addressed in one or more appendices to an EPI annex:

- The procedures and means that will be relied upon to notify and warn the public (including residential, custodial, and transient populations).
- Instructions for the immediate protective actions to take (e.g., close windows and doors, stay indoors, shut off the heating and cooling system, etc.).
- Evacuation instructions for evacuees (what to take, what to do about pets and livestock, when to leave, evacuation routes, etc.).
- Locations of mass care facilities (also called "congregate care" facilities) and associated reception centers.

Evacuation

The jurisdictions located in the plume exposure pathway should use the population information gained from the risk assessment as a starting point to develop the planning that will be relied upon to carry out an evacuation of people at risk. The range of time between the onset of accident conditions and the start of a major release of radiological materials into the atmosphere may range from a few minutes to several hours, and may affect what protective action needs to be taken. Once a release has started, it may continue for several days. Critical to the evacuation decision are the type of radiological hazard that is threatening the public, conditions at the power plant, time available to implement an evacuation, and the protective measures called for in the State's plan. In all cases the protective actions taken must be consistent with the EPA protective action guide regarding human exposure to the passage of a radioactive airborne plume.

The following planning considerations should be addressed, as appropriate, in one or more appendices to an evacuation annex:

- Identifying specific evacuation zones. These zones delineate the natural and manmade geographic features and boundaries of the risk area(s) to be evacuated.
- Preparing maps that show the specific evacuation routes for each zone, identify the preselected radiological sampling and monitoring points, and show the location of mass (or “congregate”) care facilities that may be used to shelter evacuees.
- Maps showing the population distribution around the nuclear facility.
- Provisions for protecting the population residing in a health care or police custodial facility, or are otherwise confined and who cannot be evacuated.
- Coordinating with adjacent jurisdictions and facilities located outside of the boundaries of the plume exposure pathway EPZ to facilitate evacuation.
- Provisions for contacting the sight- and hearing-impaired.

Mass Care

The following planning considerations should be addressed, as appropriate, in one or more appendices to a mass care (or “congregate care,” as it is also called in radiological emergency planning) annex:

- Ensure facilities designated for use by the evacuated public are located at least 5 miles, and preferably 10 miles beyond the boundaries of the plume exposure pathway EPZ.
- Operate reception centers to monitor, decontaminate, and register evacuees, and to monitor/decontaminate their vehicles and possessions.
- Ensure a sufficient number of facilities are available to meet the anticipated demand for shelter.

- If facilities are to be located outside of the jurisdiction's boundaries, coordinate with the adjacent jurisdiction(s) to arrange space for evacuees.
- Ensure those responsible for monitoring and decontamination have the necessary equipment and are familiar with procedures for accomplishing these tasks.
- When and as appropriate, identify sites for provision of mass care services to include:
 - Distribution of food, water, ice, clothing, etc.
 - First aid/medical treatment, if needed.
 - Temporary housing, if needed.

Health and Medical

The following planning considerations should be addressed, as appropriate, in one or more appendices to a health and medical annex:

- Provisions for determining the exposure risks and dispersal of radiological contamination.
- Identification of medical facilities capable of receiving injured people who are contaminated.
- Provisions to estimate the amount of exposure the population in the risk area has received.
- Provisions/procedures for determining when it would be appropriate to obtain (from the State Health Department) and administer radioprotective drugs to emergency workers and individuals (e.g. institutionalized people) who were not able to get out of the plume exposure pathway risk area, as well as the general population. These procedures must address the conditions under which these drugs would be administered and identify who will be responsible for making the decision for the use of radioprotective drugs.
- Provisions for emergency personnel:

- To determine, record, and maintain the daily and accumulated dose they receive.
 - To receive self-reading dosimeters and permanent record devices.
- Guidelines for authorizing workers to incur radiation exposure in excess of limits established by the EPA.
 - Provisions to radiologically decontaminate workers, equipment, and supplies.
 - Provisions for disposal of contaminated items (clothing, medical supplies, and other waste items).
 - Provisions for the medical treatment and ongoing medical evaluation of victims and workers that have been exposed to radiological hazards.

**Resource
Management**

The following planning considerations should be addressed, as appropriate, in one or more appendices to a resource management annex:

- Ensure radiological survey instruments and direct-reading dosimeters that can be used to detect and measure gamma radiation are available and that members of the mass care facility management team can operate them.
- Prepare resource lists that identify the type, quantity, and location of radiological equipment by category (protective equipment, monitoring equipment, and decontamination supplies) maintained by the jurisdiction.

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